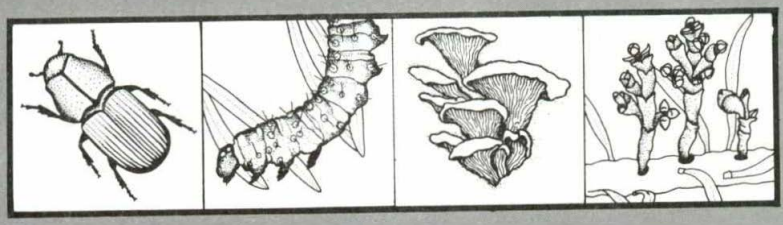
Forest Pest Management



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EVALUATION OF DWARF MISTLETOE CONTROL PROJECTS ON THE DARBY AND STEVENSVILLE RANGER DISTRICTS, BITTERROOT NATIONAL FOREST

By

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ABSTRACT

Residual Douglas-fir and lodgepole pine are infested by dwarf mistletoe on the Darby RD; residual Douglas-fir and western larch are infested on the Stevensville RD. These infested residuals pose a threat to present and planned regeneration. Felling or girdling these residuals, along with sanitation thinning of dense patches of regeneration, will reduce dwarf mistletoe intensity and increase future volume yields. Present net worth of the projects is $25 per acre on the Darby RD and $12 per acre on the Stevensville RD. Benefit/cost ratio is 1.55/ 1 on the Darby RD and 1.27/1 on the Stevensville RD. Control is recommended.

INTRODUCTION

The Darby RD has proposed dwarf mistletoe control projects on Burnt Ridge, stand 87-7-01, 195 acres; and on several dispersed areas throughout the District, 476 acres.

Judy Schutza and Eric Berg, Darby RD, and I visited the Burnt Ridge area on June 29.

The Stevensville Ranger District has proposed a dwarf mistletoe control project on 1,200 acres on the McCalla-Silverthorn Sale.

Bob Wiegand, Dave Muller, and Jack Cornelisse, Stevensville RD, and I visited the area on June 30.

United States Department of Agriculture | Forest Service | Northern Region | State & Private Forestry | P.O. Box 7669 Missoula, Montana 59807

TECHNICAL INFORMATION

Causal agents.--Douglas-fir dwarf mistletoe, Arceuthobium douglasii; and lodgepole pine dwarf mistletoe, A. americanum, on the Darby RD. Douglas-fir dwarf mistletoe; and western larch dwarf mistletoe, A. laricis, on the Stevensville RD.

Hosts.--Douglas-fir, Pseudotsuga menziesii; lodgepole pine, Pinus contorta; and western larch, Larix occidentalis.

Type of damage.--Reduction of tree vigor, height, and diameter growth, and some mortality. My estimate for average volume loss in infested Douglas-fir and westen larch type is about 20 cubic feet per acre per year. 1/ Volume loss in infested lodgepole pine is 8 cubic feet per acre per year. 1/ This does not include losses to other pathogens and insects in trees made vulnerable by dwarf mistletoe.

STAND DESCRIPTIONS

Burnt Ridge.--Pole and small sawtimber size dwarf mistletoe infested Douglas-fir forms an overstory above a fully stocked stand of ponderosa pine and Douglas-fir seedlings and saplings. Regeneration is about 15 years old.

Dispersed areas.--Several different stands are included. Stocking density of dwarf mistletoe infested Douglas-fir residuals in these stands is not as high as Burnt Ridge. Some units also support a scattered dwarf mistletoe-infested lodgepole pine overstory. Regeneration age averages about 15 years.

McCalla-Silverthorn.--This unit has been cutover five or six times; each cut was a highgrade. Dwarf mistletoe control was not given much thought in any of these cuts. Dwarf mistletoe infested Douglas-fir and western larch residuals are scattered throughout the unit. Advanced regeneration is about 20 years old.

MANAGEMENT ALTERNATIVES

1. Defer treatment.--Potential yields would be about 50 percent lower than in alternative 2. Dwarf mistletoe infestation would become worse. This alternative has the advantage of requiring the least investment.

2. Fell or girdle dwarf mistletoe-infested residuals and thin/sanitize regeneration.--This would maximize yields and largely eliminate dwarf mistletoe from Douglas-fir, lodgepole pine, and western larch.

1/ Dooling, O. J. and R. G. Eder. 1981. An assessment of dwarf mistletoes in Montana. USDA Forest Service, Northern Region, Forest Pest Management Report 81-12.

3. Convert the stands to nonsusceptible species.--This is biologically sound, but potential yields would be lower than in alternative 2. Nonsusceptible species are also not as silviculturally desirable as susceptible ones.

PREFERRED ALTERNATIVE

Preferred treatment for all units is alternative 2.

ECONOMIC ANALYSIS

Economic analysis of the control projects is based on the following data:

	Darby	Stevensville
Control costs	$45/acre	$45/acre
Years to product	75	100
Yield prediction		
No treatment	7 MBF/acre	8 MBF/acre
Treatment	10 MBF/acre	12 MBF/acre
Current stumpage	$100/MBF	$100/MBF
Discount rate	4 percent	4 percent

DARBY RANGER DISTRICT

Year	Volume without treatment (MBF/acre)	Volume with treatment (MBF/acre)	Benefit of treatment (MBF/acre)	Benefit value at harvest 1/ ($/acre)	Present value of benefit 2/ ($/acre)	Project cost ($/acre)
0						
Age 15	0	0	0	0	0	45
75						
Age 90	7	10	3	$1,325	70	-
	7	10	3	$1,325	$70	$45

1/ Current stumpage of $100/MBF increased at 2 percent compound interest.

2/ Harvest value discounted to present at 4 percent.

STEVENSVILLE RANGER DISTRICT

Year	Volume without treatment (MBF/acre)	Volume with treatment (MBF/acre)	Benefit of treatment (MBF/acre)	Benefit value at harvest 1/ ($/acre)	Present value of benefit 2/ ($/acre)	Project cost ($/acre)
0 Age 20	0	0	0	0	0	45
100 Age 120	8	12	4	$2,898	57	-
	8	12	4	$2,898	$57	$45

1/ Current stumpage of $100/MBF increased at 2 percent compound interest.

2/ Harvest value discounted to present at 4 percent.

Present net worth is the difference between present value of benefits and project cost: $25/acre on the Darby RD and $12/acre on the Stevensville RD. Benefit/cost ratio is 1.55/1 on the Darby RD and 1.27/1 on the Stevensville RD. Increasing stumpage values over time makes the projects economically feasible.

DISCUSSION

Recovery of volume losses through dwarf mistletoe control could generate additional employment in the forest products industry and result in what economists call "value added." While value added cannot be used in an economic analysis, it is substantial enough to be considered when determining overall benefits. Each million board feet of timber cut creates 10.56 person years of employment, 2/ paying an average of $16,784 per person per year. 3/ For the proposed control projects, this translates into 0.03 years of employment per acre in 75 years on the Darby RD and 0.04 years of employment in 100 years on the Stevensville RD. The increased employment would add $504 and $671 to the economy for each acre in the treatment areas on the Darby RD and Stevensville RD, respectively.

RECOMMENDATIONS

Reduction of dwarf mistletoe impact through silvicultural practices is both biologically and economically sound. I recommend the use of insect and disease funds for the projects.

2/ Personal communication; Howard McDowell, Inland Forest Resource Council, Missoula, Montana. (September 1981).

3/ Personal communication; Paul Polzin, Bureau of Business and Economics Research, University of Montana, Missoula, Montana. (September 1981).

Because control will be by felling or girdling scattered cull trees from areas already essentially clearcut, and/or thinning of overstocked stands, there will be no additional adverse impact on other resources. The projects are neither major nor controversial, and do not need environmental analyses.